

In re Patent Application of:
STORM ET AL.
Serial No. **10/820,464**
Filed: **APRIL 8, 2004**

In the Claims:

Claims 1-13 (Cancelled).

14. (Currently Amended) An image sensor comprising:
an array of pixels, each pixel comprising

a photodiode,

a first output circuit for deriving a linear
output signal by applying a reset signal to said
photodiode and reading a voltage on said photodiode
after an integration time, said first output circuit
comprising

a reset switch for applying the reset
voltage to said photodiode, said reset switch
comprising a reset transistor including a
conducting terminal connected to said photodiode,
and

a readout switch for turning on the
conducting terminal of said reset transistor after
expiration of the integration time,

a second output circuit for deriving a logarithmic
output signal by reading a near instantaneous
illumination-dependent voltage on said photodiode that
is a logarithmic function of the illumination, said
second output circuit comprising

an amplifier, and

a log select switch for connecting said
amplifier to said photodiode, and
said first and second output circuits sequentially

In re Patent Application of:
STORM ET AL.
Serial No. **10/820,464**
Filed: **APRIL 8, 2004**

providing the linear and logarithmic output signals;
and

an output selection circuit coupled to said array of pixels for selecting between the linear output signal and the logarithmic output signal as an output signal.

Claims 15 and 16 (Cancelled).

17. (Currently Amended) The image sensor according to ~~Claim 16~~ Claim 14, wherein said amplifier comprises a differential amplifier having an inverting input connected to the conducting terminal of said reset transistor, and a non-inverting input connected to a reference voltage.

18. (Previously Presented) The image sensor according to Claim 14, further comprising a calibration circuit for calibrating each pixel before deriving the logarithmic output signal.

19. (Previously Presented) The image sensor according to Claim 18, wherein said calibrating circuit comprises a constant current source selectively connected to each respective pixel.

20. (Previously Presented) The image sensor according to claim 19, wherein an output node is associated with each photodiode, and wherein the linear and logarithmic output signals are derived from the output node, said calibration circuit

In re Patent Application of:
STORM ET AL.
Serial No. 10/820,464
Filed: APRIL 8, 2004

further comprising a switch connected between said photodiode and the output node for isolating said photodiode from the output node while calibration takes place.

21. (Currently Amended) An image sensor comprising:
an array of pixels, each pixel comprising

a photodiode,

a first output circuit connected to said photodiode for generating an output signal to be a linear output signal, said first output circuit comprising

a reset switch for applying a reset voltage to said photodiode, said reset switch comprising a reset transistor including a conducting terminal connected to said photodiode,
and

a readout switch for turning on the conducting terminal of said reset transistor,

a second output circuit connected to said photodiode for generating the output signal to be a logarithmic output signal by reading a near instantaneous illumination-dependent voltage on said photodiode that is a logarithmic function of the illumination, said second output circuit comprising

an amplifier, and

a log select switch for connecting said amplifier to said photodiode,

In re Patent Application of:
STORM ET AL.
Serial No. **10/820,464**
Filed: **APRIL 8, 2004**

said first and second output circuits sequentially providing the linear and logarithmic output signals; and

an output selection circuit coupled to said array of pixels for selecting between the linear output signal and the logarithmic output signal as the output signal.

22. (Previously Presented) The image sensor according to Claim 21, wherein the linear output signal is selected if the pixel has not saturated during generation of the linear output signal, otherwise, the logarithmic output signal is selected.

23. (Previously Presented) The image sensor according to Claim 21, wherein said first output circuit derives the linear output signal by applying a reset signal to said photodiode and reading a voltage on said photodiode after an integration time.

Claims 24-26 (Cancelled).

27. (Currently Amended) The image sensor according to ~~Claim 26~~ Claim 21, wherein said amplifier comprises a differential amplifier having an inverting input connected to the conducting terminal of said reset transistor, and a non-inverting input connected to a reference voltage.

28. (Previously Presented) The image sensor according to Claim 21, further comprising a calibration circuit for calibrating each pixel before deriving the logarithmic output

In re Patent Application of:
STORM ET AL.
Serial No. **10/820,464**
Filed: **APRIL 8, 2004**

signal.

29. (Previously Presented) The image sensor according to Claim 28, wherein said calibrating circuit comprises a constant current source selectively connected to each respective pixel.

30. (Previously Presented) The image sensor according to Claim 29, wherein an output node is associated with each photodiode, and wherein the linear and logarithmic output signals are derived from the output node, said calibration circuit further comprising a switch connected between said photodiode and the output node for isolating said photodiode from the output node while calibration takes place.

31. (Currently Amended) A method for operating an image sensor comprising an array of pixels, each pixel comprising a photodiode, the method comprising:

deriving a linear output signal from each pixel using a first output circuit comprising a reset switch for applying a reset voltage to the photodiode, the reset switch comprising a reset transistor including a conducting terminal connected to the photodiode, and a readout switch for turning on the conducting terminal of the reset transistor after expiration of an integration time;

deriving a logarithmic output signal from each pixel using a second output circuit by reading a near instantaneous illumination-dependent voltage on ~~said~~ the

In re Patent Application of:
STORM ET AL.
Serial No. 10/820,464
Filed: APRIL 8, 2004

photodiode that is a logarithmic function of the illumination,
the second output circuit comprising an amplifier, and a log
select switch for connecting the amplifier to the photodiode;

sequentially providing the linear and logarithmic
output signals; and

selecting between the linear output signal and the
logarithmic output signal as an output signal.

Claims 32 and 33 (Cancelled).

34. (Previously Presented) The method according to
Claim 31, further comprising calibrating each pixel before
generating the corresponding logarithmic output signal.

35. (Previously Presented) The method according to
Claim 34, wherein each pixel is calibrated by applying a constant
current thereto.

36. (Previously Presented) The method according to
Claim 35, wherein an output node is associated with each
photodiode, and wherein the linear and logarithmic outputs are
generated with respect to the output node, and a calibration
circuit comprising a switch is connected between the photodiode
and the output node for isolating the photodiode from the output
node while calibration takes place.